Industrial Finishing

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From the Editor's Desk

TO BE TOLD bluntly to "Work harder and get less for it," doesn't register as pleasantly as some of the sedative phrases that have been coined to picture a rosy easy-moneyed future, and only a short time to wait for it. Too many individuals and firms not faring so well are just waiting, hoping, and complaining—afraid or unwilling to "work harder and get less for it." Others have taken depression's bitter tonic and are working with renewed energy and determination—and getting results.

Of course, the individuals and firms that are suffering no disorder—no diminishing of income—may not need any of the depression tonic. For others only slightly affected it can be safely prescribed to be taken only "half strength," but the sooner the thousands that are in serious trouble take this tonic full strength, the sooner we will see an end to what so many are complaining about today.

* * * *

MANY orders in industry now call for small quantities for immediate delivery and since the buyers' wishes are practically law with manufacturers today, it becomes necessary for more concerns to be prepared to give this quick small-order type of service on whatever products they sell. Another case of working harder and getting less for it.

* * * *

DURING the period of diminished industrial activity many manufacturers have been busy developing improved or entirely new products in their line. This research and development work has been and is being pushed extensively in order that the firms will have something new, attractive and better to offer to the trade. These companies are going all the way toward making their new products right before releasing them for use in industrial finishing; permanent concerns can't afford to have what they offer go wrong. Men familiar with the business know that every finishing material and every piece of finishing equipment must be made as nearly trouble-proof and fool-proof as possible to "make good." Some of these developments are being announced in the advertising pages of this issue of INDUSTRIAL FINISHING; others will be announced later.

* * * *

SUMMER time means open windows in many finishing rooms and as a result the attendant dust and dirt and variations in humidity of the air—all of which present problems for the finisher. Windows are opened principally to promote a movement of cool fresh air throughout the room for the comfort of workmen. Air filters or dust screens placed over open windows will prevent the entrance of outside dust or dirt. If the free admission of summer breezes loosens and releases dust or dirt or flakes of paint inside the room, then cleaning up the interior walls, ceiling and posts should put an end to this trouble. But the humidity of the air is an uncontrollable factor while open windows are freely admitting outside atmosphere. Other remedies must be employed to prevent or eliminate whatever trouble may be caused by excessive moisture in the atmosphere—for example, the use of suitable solvents in the lacquer to prevent blushing, the allowance of more time for drying, etc.

R. H. Rohr

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Chemical Specialties Division

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Wood Fillers and Their Use

By T. W. BARRETT

Foreman finisher at Adler Mfg. Co., Louisville, Ky., gives some interesting information on the selection, testing, mixing and use of filler from a production standpoint in the manufacture of fixtures, radio cabinets and other wood products

IN THE SMALL shop where production is limited, wood fillers offer many problems and require lots of attention if good results are to be obtained. In the large finishing department we are confronted with practically the same problems as the small shop, plus several added feature worries peculiar to volume production.

Production demands synchronized finishing schedules. To obtain this we must have system, rules and regulations—all of which must be enforced to the letter. While these systems, rules and regulations compensate in a measure for the personal touch in the smaller shop, they do not entirely eliminate the human element that causes errors, waste, etc. Another factor which affects only the large shop is that, due to the volume of production, errors and waste are frequently magnified many times.

Take wood filler for instance; we buy this in "one-time shippers" or light drums which contain 450 to 475-lbs. I have found that a good grade of filler has a minimum of free oil. All of the filler in the drum is rich in oil, with only a small quantity covering the mass. On opening the drum we use a pointed stick to work this free oil into the paste. This done, the end of the drum is clamped in place and remains so until paste is needed. To avoid opening drums continuously and to eliminate confusion, we make an effort to mix filler twice a day —the first thing in the morning and just after noon.

In a large volume of standard wood products, there are many varieties of texture in the same species of wood. Some of these could be satisfactorily filled with a filler mixed anywhere from 10 to 13-lbs. to one gallon of benzine. Of course separation of the various textures would be impracticable, so we count "safety first" and mix all of our fillers 13-lbs. of paste to one gallon of benzine.

We brush filler on the wood surface. Before going into this particular subject, I want to add a word or two about the wood surface to be filled. We build all plywood used in our plant, hence we are in a position to control the selection of face veneers, glue mixture, and the pressure used in gluing the plywood. This

First we mix enough benzine with the paste until the consistency is about like thick cream. This is worked thoroughly. Then benzine is added until the mixture has a consistency sufficient to register 28 points on a heavy-liquid hydrometer dropped into it. This is equal to a 13 to 1 mixture. We have found this method quicker and less wasteful than mixing by weight and measure.

branch of the work has been given considerable time and study with the result that our veneered surfaces are clean, and no glue is forced by pressure into the pores of the wood. This is of utmost importance, as there is little space left in glue-filled pores for the filler—and the small amount of filler that is forced into the partially filled pores is generally wiped out in the padding operation.

Now to proceed with the filling operation: In about 15 minutes, or whenever the filler coated surface appears gray, we use jute tow to pad the filler into the pores. This tow collects the filler well, forms a springy pad, does not wad up nor become hard. After the filler has been thoroughly worked into the pores of the wood, the surface is wiped clean with clean lint-free rags, and the piece is allowed to dry.

We employ both kiln drying and air drying for drying filler. Filled work is air dried 24 hours, and those pieces placed in the kiln remain there 12 hours. I realize there are fillers on the market which will dry, so it is claimed, satisfactorily within anywhere from three hours up, but our plant is laid out and our organization is geared to suit the above production schedule. We prefer safety to sorrow.

Insufficient drying of filler generally causes bridging and chipping if lacquer is used in the final coats. If varnish is used in the final coatings, undried filler will retard the drying of the varnish, cause subsequent shrinkage, case-hardening, and checking of the finish. We obtain excellent results with the finish evidenced, not only while the work is in our plant but also after it leaves the plant.

We test a new filler thoroughly before it is put into work by actual use according to the particular finish specifications, noting not only the final results, but (1) whether the filler sets properly in a reasonable time, (2) if it cuts off smooth at the surface and (3) it's final drying qualities. A filler should be avoided if it is soft and sticky, as it will be difficult to clean off and slow in drying. We do not change our source of filler and we do not use cheap filler. One of the worst forms of economy is to attempt to produce a satisfactory and durable finish with cheap filler.

At the beginning of this article I mentioned magnified worries or problems caused by volume production. A specific example of this would be filler trouble caused by (1) an inferior filler, (2) misapplication or (3) insufficient drying, resulting in ruined finish on approximately 500 cabinets. In these days of close competitive prices, this means but one thing—Loss.

I am convinced there is only one formula for producing a high grade finish on a production basis and that is: (1) correct shop conditions, such as clean, humidity-controlled air, plus (2) suitable equipment, plus (3) quality finishing materials, plus (4) men skilled in their particular work. Add to this, close supervision, and the results will equal and sometimes surpass that of the personally conducted small shop.

If antiquity and high adventure and lofty endeavor are the building stones of romance, then the history of paint is the very essence of romance.

Part II with More about—

New Lacquer Developments

By
*C. W. SIMMS**

In Part I of this article a few of the outstanding developments in the formulation principles of clear lacquers were discussed. No less important and numerous are the changes which have taken place in the principles of formulating pigmented lacquers. In fact, not only do most of the changes in clear lacquers apply to pigmented lacquers too, but also there have been a great many changes applicable to pigmented lacquers alone

PIGMENTED LACQUERS, (lacquer enamels, colored lacquers, etc.) differ principally from clear lacquers, in that they contain coloring matter in the form of dry pigment colors. These dry pigment colors are incorporated in the clear lacquers by a process commonly called "grinding," but which is in reality a process of dispersing and wetting the pigment with the liquid vehicle.

Surprising as it may seem, the same methods of dispersing pigments used years ago are still in vogue, and with the possible exception of a few types of equipment are fundamentally wrong for lacquer, due to the extreme volatility of the lacquer solvents.

New Method Valuable

In keeping with the modern trend of the lacquer industry there has recently been developed and put on a commercial basis a new method for dispersing pigments. This process, of German origin, is essentially one of impregnating the "alcohol wet" nitrocellulose fibers in an aqueous medium with the desired pigment, by precipitation or otherwise. The water is then displaced with alcohol and the resultant mass is brought to a paste consistency with common lacquer solvents. This paste has a definite affinity for the balance of the materials used in the production of colored lacquer and is therefore incorporated with them at once and without grinding.

The outstanding advantages of colored lacquers made with pigments which have been incorporated by the foregoing method, due to the wonderful pigment dispersion obtained, are: (1) increased gloss, (2) smoothness of film, (3) greater covering and hiding power, (4) better adhesion, (5) cleaner colors, (6) reduced settling of pigments.

It is also quite significant to note that while the developments along this line have taken place largely with respect to nitrocellulose lacquers it is also possible to disperse pigments by this process in other vehicles such as synthetic enamels, etc.

Another recent development worthy of note is the production of a non-bleeding, non-fading red pigment which approaches in color the red dye pigments. This pig-

* Wabash Products Co., Terre Haute, Ind.

ment has a definite place in lacquer production and is finding many uses in the sign industry as well as in general industrial lacquers. Finishers have long felt the need for non-fading, non-bleeding reds.

It is interesting to note that, with few exceptions, there have been no outstanding changes in the solvents used in lacquer manufacture. One exception, however, is a new brushing lacquer solvent. Rather than call this solvent "new," it would perhaps be more in keeping with the truth to say that a one-time laboratory curiosity has been found to be an admirable brushing lacquer solvent and is now commercially available.

With this solvent it is now possible to make a brushing lacquer which produces a film with all the properties common to nitrocellulose lacquers but which can readily be brushed. These lacquers can be brushed with the same ease and for practically the same length of time as enamels. Being composed of very slow evaporating solvents, they do not set up for one to two hours and have wonderful flowing properties. Brush marks are almost never encountered. A high gloss is possible without making great sacrifices in durability as was necessary with the old type brushing lacquers.

With this new brushing lacquer a tremendous field—that of architectural finishes—is now a very promising prospect for lacquer. The extreme durability of lacquer together with its appearance, washability and maximum resistance to the collection of dirt makes this finish nearly ideal for plaster walls and woodwork. Quite a number of large scale applications have already proved their merit. This brushing lacquer is also finding an outlet in the sign industry as well as in numerous other industrial applications.

"It is my sincere hope that this article, however crude in its make-up, will arouse the interest of industrial finish users in the ever increasing number of new finishes. It has been a real pleasure to prepare this article for *Industrial Finishing*, and I hope that the readers enjoy it as much."

By means of the new solvent mentioned above it is now possible to make a lacquer silk-screen paste which is slow enough drying that it does not clog the screen and otherwise has eliminated the difficulties formerly encountered with lacquer pastes for silk screen work.

Synthetic Resins

As previously pointed out, the field of synthetic resins has received a great deal of attention during recent years. As a result their introduction as resins for pyroxylin lacquers has been very rapid. Colored lacquers made with some of the new synthetic resins have many advantages over the old type lacquers, paramount among which is their increased durability. They also have much better adherence to metal as well as wood. With some of the synthetic resins, colored lacquers may be made to have extremely high gloss without any particular sacrifice in durability. On exposure these lacquers are unique in that they are almost entirely free from chalking, keeping their gloss for long periods of time.

Due to the fact that these lacquers can be made to have much more solid material than was pre-

viously possible the filling properties are much improved. Also, it is possible to incorporate quite a little more pigment and thus improve the covering and hiding power greatly. Lacquers made with some of the synthetic resins have exceptional flow thereby reducing orange peel to a minimum. The resistance of lacquers made with some of these resins to the action of various acids, alkalis, and other chemicals is remarkable.

There is now available a resin which produces an extremely flexible lacquer and which does not seem to harden with age. In addition to its extreme flexibility it has virtually all the other properties of the synthetic resin lacquers including durability, adhesion, etc. This particular type is finding many applications on wood, rubber, metal, paper, cloth, etc.

By means of some of these synthetic resins, pyroxylin undercoat systems for wood and metal can be made which compare very favorably with oil undercoats.

In addition to the use of synthetic resins in pyroxylin finishes there has been much work done on synthetic finishes which do not contain nitrocellulose. Materials of this type are now offered in both air-dry and baking types. The air-drying types are still somewhat imperfect but will undoubtedly be continually improved. The baking type in both clear and pigmented forms will bake rapidly at rather low temperatures to hard, tough films. The adherence of these materials is very remarkable and makes them attractive as undercoats. As finishing coats they yield films which are replacing oleoresinous enamels and in some instances, porcelain enamels.

While these synthetic enamels are certainly in their infancy as finishing materials they have, nevertheless, proved themselves to be a fertile field for study. The wise manufacturer will keep in very close touch with the developments along this line.

This article has probably only scratched the surface of recent developments in the lacquer industry. It is to be hoped, however, that it has covered sufficient territory to impress the consumers of lacquers of the changes which are constantly taking place, and should tend to place them on guard for taking full advantage of new finishes offered them.

Improved Spray Guns

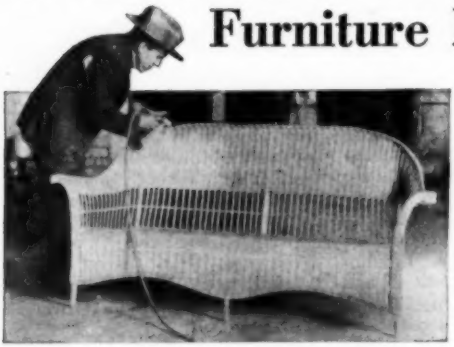
When air brushes were introduced which could be adjusted to vary the size of the spray from a wide fan all the way down to a fine line, something was accomplished which meant much in certain branches of the industry. Those who have a great deal of intricate work to perform are practically unanimous in their endorsement of this device. The advantages it possesses do not handicap it in any way, since it is adaptable to the application of either light or heavy materials.—J. E. H.

A recent survey was stated to have brought out that public construction activities to the value of $2,500,000,000 are now going forward.

Automobile Finishing Methods

The Sherwin-Williams Co., Cleveland, Ohio, has published a revised edition of its interesting booklet on "Modern Automobile Finishing Methods." The booklet contains 42 pages, 5½x9-in., of complete and valuable information on practically every phase of automobile finishing. There is also included in this booklet an automotive finishing guide.

Reed Basket and Wicker Furniture Finishing



By J. C. COYLE

Some interesting highlights in the forming, glue sizing, spray finishing, two-toning and decorating of reed baskets, wicker and rattan furniture—with suggested colors and formulas

ABOUT THE first of each year, the basket maker endeavors to get out several attractive numbers to interest his customers. These include both new patterns and combination finishes. These finishes are varied in accordance with the demands of the season, the lighter colors being popular in the spring, while blue and copper, green and gold have their turn in the autumn. Some color combinations move slowly, while others (an ivory two-tone for instance) are generally good. In a happy selection of colors and their proper application, lies the basket maker's success.

At the shop of the Mile High Basket & Wicker Furniture Co., Denver, Colo., a series of standard forms are used in shaping a great many varieties of baskets. Reeds are soaked for a few minutes in cold water before using. Rattan for furniture is steamed in hot water. After the baskets or furniture, as the case may be, are formed they are allowed to dry thoroughly; then they are dipped in a vat of glue sizing. This size is prepared by mixing 3-lbs. of glue to two gallons of cold water. The mixture is allowed to stand about two hours before heating. After dipping the pieces in the size, they are allowed to dry for about six hours, or until thoroughly dry.

The glue size stiffens the structure of the basket and forms a good base for the finish. A spray coat of flat paint is applied and allowed to dry overnight. Next, the piece is given a spray coat of 4-hour enamel, and this is allowed to dry at least 12 hours in order to produce a hard surface for wiping off the subsequent coat. The two-tone flat color is prepared by mixing a gallon of flat undercoat, one pint of linseed oil, ½-lb. of medium green ground in oil and a teaspoonful of chrome yellow, medium, cut with benzine. This formula may be varied as desired by adding burnt umber and ochre to darken the color, or ivory or lighter green to lighten it.

In furniture finishing, where the

primary coat is bronze, more color should be added to the two-tone mixture. This is especially necessary to cover the work properly when only one coat of bronze has been applied. After mixing the two-tone material, it is advisable to leave it uncovered overnight which permits some of the gas to evaporate, so that it will not cut into the other paint when applied. The color is sprayed on and then wiped off quickly to prevent cutting in. In the larger pieces, only a part of the surface is sprayed, and then wiped with a soft rag.

Following the two-toning, pieces are allowed to dry at least 12 hours before the final coat of clear varnish is applied.

In this shop the finishing operations on furniture consist chiefly of refinishing, only a few special articles being manufactured. On the new articles the process is practically the same as on baskets, except the varnish coat is omitted.

In refinishing wicker furniture, if the paint is scaling a great deal, a wire brush is used to go over the entire piece. This treatment loosens the scale, which is then blown off by air. To uniform the surface, a spray coat of lacquer reducer is applied. If the lacquer reducer does not prove strong enough to soften and blend the old finish, a half pint of varnish remover may be added to a gallon of lacquer reducer to accomplish the uniforming. The pieces should stand at least eight hours after the uniforming coat, and then proceed as above described.

For refinishing old hickory chairs it is advisable to spray on a coat of material made up of one part linseed oil, two parts turpentine and one part japan dryer. This is allowed to stand for about three days, so that the oil will dry thoroughly. If desirable the chairs may then be given a spray coat of clear varnish. The linseed oil, of course, preserves the life of the wood and improves the appearance of the chair. Furniture of this kind is particularly suitable for porches, lawns and gardens.

A typical group showing a variety of finished baskets

Automotive Finishing

Reducing and Mist Coat Lacquer Thinners

By
A PAINT SUPERINTENDENT

A well informed automobile paint superintendent explains the functions and characteristics of reducing and mist-coat lacquer thinners, and tells what materials make up these thinners, explaining in detail why and in what percentage each material is used

THE PURPOSE of a reducing thinner is primarily to reduce a lacquer to spraying consistency. Incident to this quality of reducing, it must have certain other qualities which, while not absolutely imperative, have a very important bearing on the cost of the finished product. These various secondary objectives being (1) leveling qualities, (2) resistance to humidity, (3) odor, and (4) toxicity.

That reducing of a lacquer to a proper spraying consistency is the primary object of a reducing thinner is accepted on all hands, and I shall first dwell upon that aspect. Generally, lacquers are shipped so they will reduce 50/50 with a reducing thinner. When thus reduced they should have a spraying consistency which, in terms of gravity and viscosity, depending on the color of the material, should range from 22 to 30 light liquid in gravity and to 25 to 32 seconds in viscosity Ford cup No. 4.

Lacquer thinners in general consist of three constituents—namely, (1) diluents, (2) solvents, and (3) alcohols.

By far the largest percentage of the lacquer thinner is the diluent. The function of the diluent is primarily to lower the cost of the thinner. Nevertheless, the nature of the diluent must be such as to not interfere with the solid constituents of the lacquer. In general, the diluents are hydrocarbons and mineral spirits, like benzol, toluol, naphtha, etc.

In the formulation of a lacquer thinner it becomes necessary, therefore, that the amount and the nature of the diluent does not in any way interfere with the solid lacquer constituents. In other words, while we know that these diluents have absolutely no solvent action on lacquer, they must have a certain amount of tolerance for other friends of nitrocellulose in the lacquer—for example, gums.

If these diluents are not compatable with the gums contained in the lacquer, it will be necessary in the formulating of lacquer thinner to add an alcohol or a solvent that will, along with its solvent action for nitrocellulose, keep gums in solution. Of course, this will result in a higher cost and as such is generally discouraged. In other words, the diluents generally used take care of the gums by keeping them in solution; they are usually gum solvents.

Realizing that 98% of the lacquer thinner used with the lacquer leaves the surface of the body within a very few minutes, and as such is a total loss to the consumer, the use of cheap diluents in a lacquer thinner becomes a necessity.

The most common diluent used for thinner is toluol. Some manufacturers might use benzol when the prices of toluol are away too high, but it must not be forgotten that benzol is very strongly poisonous to all living animal cells, including the human being, and as such lacquer thinners containing benzol must not be used in any plant under any circumstances. Certain states have laws against the use of benzol in any form, especially in the rubber industry. The effect of toxicity while slow is generally fatal and the symptoms are the general, slow yellowing of the skin and almost sudden yellowing of the cornea of the eye.

Solvents

The solvents are the real workers in the lacquer thinner, in that they reduce the viscosity of the lacquer to spraying consistencies. These solvents are generally chemically known as esters, and comprise materials like ethyl acetate, butyl acetate, amyl acetate, etc., and are recognized by their usual "banana-oil" odor.

No rules can be drawn in regard to the use of these esters, except that a certain amount of ethyl acetate is necessary because it helps to reduce the viscosity of the lacquer very quickly. Nevertheless, it has the greatest drawback in that its fast evaporation from the surface of a body, as its consequent cooling results directly in blushing if the humidity is high. Worse than this, under ordinary weather conditions, its quick evaporation results in excessive orange peel—the curse of a paint shop, because of subsequent operations necessary to eliminate the orange peel. The greater the amount of solvents like ethyl acetate, commonly called low boilers, the greater the risk in form of orange peel and blushing. Solvents like butyl acetate (medium boilers) are generally the best suited for universal thinners —thinners that can be used safely by anyone most of the time.

Wherever excessive amounts of ethyl acetate and low evaporating diluents have been used, it is always wise to add 10% or 15% of high boilers, like amyl acetate or butyl propionate. The high boilers, because of their slow evaporation, permit a lacquer sprayed surface to flow out thus eliminating a greater part of the orange peel. Furthermore, because of their slow evaporation and consequent very slow cooling of the body surface, they do not permit blushing.

Blushing, very briefly, is the throwing out of nitrocellulose from the lacquer film by the sudden cooling of the surface of the body and consequent absorption of moisture from the air. It is very reasonable then to expect a high boiler, which evaporates slowly and stays in the lacquer film longer, to not permit nitrocellulose from breaking its friendly relationship with the balance of the lacquer film. As such it eliminates blushing and, because the high boiler stays in the lacquer film longer and is a good solvent, there is very little orange peel caused. What little orange peel is caused by ethyl acetate which evaporates very quickly from the film is taken care

of by the high boiler which makes the orange peel level out.

Alcohols

The alcohols are generally added, because first, they have a great tendency to offset blushing on account of their affinity for water, which they absorb rather than let water throw out nitrocellulose; second, due to very slow evaporation, they do not permit the sudden cooling of the body surface, which in bad weather generally brings the temperature down to the "dew point," and as such avoids blushing.

I believe it is safe to say that lacquer thinner should consist of the following:

Diluents	45 to 60%
Solvents	45 to 30%
Alcohols	10 to 10%

The diluents may be 25 to 40% petroleum spirits; 60 to 75% toluol; or toluol substitutes.

Solvents: Esters—low boilers 50 to 40%; medium boilers 25 to 30%; high boilers 25 to 30%.

Alcohols: Low or medium boilers about 10%.

Mist Coat Thinner

The function of a mist coat thinner is to level out microscopic hills and valleys left by the sandpaper operation on the lacquer coats. In general, these scratches are less discernable when the lacquer coats are oil sanded than when they are water sanded, because oil or gasoline is a better lubricant for sandpaper than water.

I have already dealt with the fact that low boilers create orange peel and cause blushing, and because of this it becomes imperative that mist coat thinners should have high boilers, which will preclude all chances of creating orange peel and will make the little hills and valleys level out into a smooth surface.

Thinner manufacturers have contended that it is necessary to incorporate very low quantities of diluents, but it is my contention that as long as there are strong high boilers that stay in the lacquer film a long time, it is not imperative to hold the percentage of diluents to a minimum. One can incorporate 50%, and as high as 55% of diluents, balance divided between high boiler, like amyl acetate, and alcohol, like amyl alcohol, to a very good advantage.

In general, a good mist coat thinner may consist of—

Toluol	45%
Butyl acetate	25%
Amyl acetate	15%
Butyl alcohol	15%

A mist coat thinner of this composition is well within reason in regard to cost, and will work admirably under all conditions.

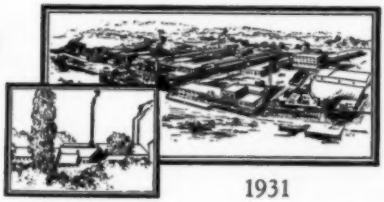
Aircraft Finishing Specifications

Berry Bros., Inc., 211 Leib St., Detroit, Mich., have just issued the fifth edition of their booklet "Specifications for Aircraft Finishing." This new edition has 37 pages, 8¼x10¾-in. in size, and contains a treatise on airplane finishing giving in detail complete airplane finishing specifications. It also contains three full pages of production suggestions. Along with the booklet is enclosed a Berry Brothers Bulletin containing an illustrated article on "How to Design and Build an Aircraft Finishing Room" by H. Harvey Dyer, Jr.

Emrich Formerly of Glidden Now with Jones-Dabney

Mr. Fred Emrich, formerly general industrial sales manager for The Glidden Co., Cleveland, Ohio, is now general sales manager for the Jones Dabney Co., (industrial lacquers, varnishes and enamels) Louisville, Kentucky.

Growth



1884 1931

● As we near the half-century mark, it is with a sense of work well done, service well rendered and pride in achievement. The present preëminence of

ZAPON PYROXYLIN LACQUER

is the logical result of constant experiment and research to achieve a perfect product.

ZAPON

THE ZAPON COMPANY

A Division of Atlas Powder Company

STAMFORD • CONNECTICUT

Staining and Dyeing Wood Baskets, Boxes, Hampers

By
S. S. HARKAVY

Why wooden package and container manufacturers have become interested in colors, what colors many have adopted and how these color solutions are prepared and applied economically

IN MANY industries, the wooden container—splint basket, veneer hamper or thin wooden box—is preferred over any other type of container; this is because of the strength of the package, the ease of handling, and the fact that it allows for better shipment of perishables.

However, in this age of color-mindedness, the wooden container manufacturer has been presented with the problem of livening up the familiar appearance of his new wood products with color. In this he has been fortunate in finding a real solution to the problem through the use of dyestuffs—particularly satisfactory for the following reasons: (1) they require no elaborate equipment, (2) they are not expensive and are concentrated—they go a long way, (3) they require no technical man for the job—the processing is simple.

About the only apparatus required in the dyeing operation is a dipping tank (preferably galvanized iron or wood) measuring—according to requirements of production—say 6-ft. in length, 2-ft. in depth and about 4-in. wider than the longest piece to be dyed. Such a tank, while possessed of a capacity of 112 gallons, more or less, will only accommodate 80 gallons of dye solution. There should also be available a steam hose which will allow the dye solution to be heated to a temperature of 120° F.

Dyestuffs Required

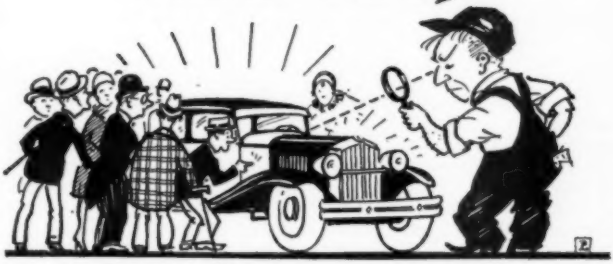
The class of dyes most commonly used in the staining of wood articles for the cooperage trade is typified by a "Woodstain" series (name on request) which is remarkable for its great tinctorial power and brilliancy of shade.

The following types (in this brand) I have found the most practical: yellow, yellow woodstain R., yellow woodstain A.; orange, orange woodstain special; red, bright woodstain special, bright red woodstain G. H.; magenta woodstain special; brown, brown woodstain special; blue, royal blue woodstain, blue woodstain 2 R., blue woodstain G.; violet, violet woodstain special; green, brilliant green woodstain special; green yellowish woodstain; green woodstain special; black, fast woodstain black special.

As already mentioned, the processing requires no technical supervision; it is really very simple. Any worker with average intelligence, after reading these directions, should be able to run the work through quickly and efficiently.

A good staining solution of the dyestuffs mentioned may be made by dissolving 2-lb. of color to 40

Beauty *is* only skin deep



Lac says:—"Beauty *is* only skin deep. When a lacquer finish becomes prematurely weather-beaten and shabby the car is considered a 'bad buy' even though the mechanical parts may be in good working order."

Stand on the corner of a busy street and watch the cars stream by. Too many have lacquer finishes that belie their actual age. Many cars six months old look as if they had been driven two years.

Many automobile manufacturers are buying their lacquers without heeding quality—considering only cost. But if these same manufacturers would specify lacquers properly formulated with

PENTASOL AND PENT-ACETATE

they would obtain a long-life lacquer finish at a reasonable price. After all, beauty *is* only skin deep.

The SHARPLES SOLVENTS *Corp.*
2304 WESTMORELAND ST., PHILADELPHIA
548B RAILWAY EXCHANGE BLDG., CHICAGO
501A FIFTH AVENUE, NEW YORK CITY

gallons of hot water in the following manner: The dyestuff is made into a paste by pouring over it an equal quantity of acetic acid (70% commercial) as color (this is approximate and need not be accurate). This paste is thoroughly stirred and hot water is added, the temperature being about 180° F. This mixture is then stirred carefully until the dye is in complete solution.

In the series of colors above, there are only two exceptions to this procedure—namely, yellow woodstain A, and magenta woodstain special.

In making solutions of special woodstain A, the heat of the solution should not exceed slightly over body warmth, as excessive heat causes detrimental color changes. In dissolving magenta woodstain special, the acetic acid mentioned above is substituted with alcohol. The solution is then diluted to the desired strength (shade desired) with hot water.

After the dye solution has been prepared, it is simply a matter of dipping the wood material as explained further.

Mechanical Operation

The bundles of cleats, shooks, staves or strips are loosely tied to enable the dye liquor to reach each cleat. A steam hose is led into the vat, the dye solution is heated to 120° F. approximately, and the strips are dipped for a few moments. If it is desired, the operation can be done with a cold solution, but to insure the best practical results heating is more desirable. According to information given, 80 gallons of dye solution is sufficient to color about 50,000 strips; this figure is dependent, of course, upon the size and type of strips and the depth of shade required.

The pieces are then allowed to dry either naturally or artificially —but not in too great a temperature. For the latter means, there is required a drying room fitted with steam coils or dry radiation of not too great temperature. The size of the room is determined by the production and requirements.

If improved water fastness is desired, the man assigned to the coloring job may prepare a second bath consisting of 6-lbs. of permenator (same brand as other products) to 40 gallons of water. After the wood has been stained and dried, it is then passed through the aforementioned fixing solution. While the shade is dulled by this added operation, the water fastness (rain proofness) is greatly improved.

Color's Value

Many concerns already have started to add color to their packages.

One of the best examples possible is furnished by the fruit packers, who have adopted the novel method of designating their fruits by the coloring of the shooks, cleats and staves of their containers.

For illustration: apple containers are colored red or green; orange boxes are orange hue; plum boxes purple, etc. This constructive move not only has been an aid in the making of an attractive and more appealing container, but is also a distinctive aid in the standardization of packages for rapid handling.

Color then can be used either for designating the contents of the package, or to distinguish the product of the individual manufacturer or packer—and in the latter connection it need only be mentioned that the strides made by the gasoline manufacturers to properly

Measure Lacquer Economy by Thinning Capacity

No. 6218 H. B.
Clear Gloss Lacquer
Reduces Farther

THE selling price of any lacquer does not accurately show its cost when ready for application. Since thinner costs less than lacquer, the more you can reduce your lacquer and still get good body, the lower its cost becomes.

Day's No. 6218 Heavy Bodied Clear Gloss Lacquer stands more reduction than other lacquers selling at the same price. Yet, because of its high content of solids, it produces a heavier body when reduced to spraying viscosity. Its better filling qualities make it ideal for use under flats.

No. 6218 is pale, flows nicely, polishes to a brilliant lustre, and will not bloom under oil rubbing. It retains its flexibility indefinitely, which means that it will not scratch white.

Measured by the most exacting standards, No. 6218 is a very economical lacquer. Order five gallons at the drum price for trial, satisfaction guaranteed.

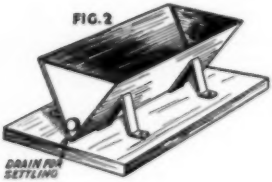
JAMES B. DAY & CO.
CHICAGO

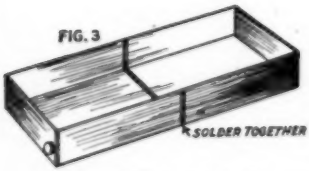
Economical Lacquer Finishes, Enamel, Stain, Shellac, Sealer, Etc.

distinguish their product in the mind's eye of the consumer.—*Barrel & Box & Packages.*

Utilize Empty Containers

The small shops doing job lots of work can use to good advantage several of their empty 5-gallon and 10-gallon containers, such as shown in Fig. 1, for making small dip trays and baths. These useful accessories are to be had at practically no cost except the





Easily made but very useful.

time required to cut them apart with the tin snips—and the results are well worth this.

By cutting the tin diagonally as marked at *A*, Fig. 1, the dip or small ware bath is made as shown in Fig. 2, and by cutting the tin as indicated at *B*, Fig. 1, the two halves can be soldered together to give a long shallow tray or dip, see Fig. 3.

These containers have the advantage of being cheap and after a little use they can be easily replaced.—C. H. Willey.

Lacquer Bulletin

Hilo Varnish Corp., 1 Gerry St., Brooklyn, N. Y., has published a third edition of its Bulletin No. 11 about Hilo lacquers. According to the company this bulletin has been completely revised, new products are introduced and up-to-the-minute methods of finishing on either wood or metal in white, black or colors are described in detail.

Sanderson Pearcy-Marietta, Ltd., Organized in Canada

Sanderson Pearcy Ltd., Toronto, Canada, has been reorganized under the name Sanderson Pearcy-Marietta, Ltd., and will market a complete industrial and trade sales line in Canada and British possessions. Mr. Phillip Grandjean, formerly of Ford Motor Co., of Canada, is president of the newly formed company, and the directorate is made up of the executives of the Sanderson Pearcy Ltd., and The Marietta Paint & Color Co., Marietta, Ohio.

Executive offices of the new company will be located at Van Horne and Dufferin Sts., Toronto, Ontario, Canada.

Commercial Color Book

Authentic color combinations, destined for commercial and decorative purposes and comprising more than 1000 individual schemes, have been created by O. W. Wentz & Associates of 101 Park Avenue, New York City. The wide range of color schemes has been gathered into a book which, it is expected, will find a wide use among those industrial organizations which are specializing so much in color as a sales help for their products. The past several years have seen the rise of a great number of new colors which have revolutionized sales problems, and it is with these new combinations that Mr. Wentz principally deals. The book is bound in Fabrikoid and a limited number are being offered for sale.

No Matter What You Paint . . . . . from Box Cars to Golf Balls . . .

there's SPECIALIZED Paasche Airfinishing and Aircoating Equipment to do it BETTER at GUARANTEED SAVINGS★

Regardless of what you make . . . in what quantities . . . or in what size, shape or weight . . . you can give it a better finish, coating or rubbing with Paasche equipment at a tremendous saving in time and materials. There's a specialized equipment for every purpose.

See how you can slash your finishing costs. Learn what Paasche manual or automatic equipment is doing for others. Ask for estimates and specifications on our standard or specially-built units.

★ Note how much these leading industries are saving with Paasche Equipment . . . railroad cars 50% . . . tug boats and barges 91% . . . . tractors 94% . . . . . painting automobile chassis 50% . . . Yo Yo toys 58% . . . Full details of how leading industries are cutting finishing costs are included in our "Guaranteed Savings" book. Write for yours *today*! It's free.

Paasche

the choice of the Nation's Greatest Industries

Paasche Airbrush Co.

1921 Diversey Pkwy., Chicago
Branches in all Principal Cities

New Materials and Equipment

Presenting briefly, certain outstanding features of new or improved materials, supplies and equipment which have been developed and made available for use in modern industrial finishing departments

Gas-Driven Sprayer

A light-duty gas-engine-driven spray-painting outfit has recently been developed by The DeVilbiss Co., Toledo, Ohio. This outfit, known as the NH606, makes possible the efficient and economical spray-painting of light or small work at points where electric current is not easily available. The outfit can be carried by one person or in any standard make automobile. However, it is large enough to produce high quality work at surprising speed.

Fast, economical, efficient

Satin Finish Wood Lacquer

A new lacquer product known as "Clear Aultone" has recently been placed on the market by its manufacturer The Ault & Wiborg Varnish Works, Inc., Cincinnati, Ohio. Clear Aultone is an alcohol-proof satin finish wood lacquer that is tough, flexible and mar-proof. According to the manufacturer Clear Aultone is free from bloom—no grayish cast, even in using two or three coats; it dries with beautiful semblance of rubbed finish. Does not cake or harden in container.

This material is made in two grades—No. 152A, which excels in building and filling qualities, and No. 146A, which has exceptional alcohol resistance and is preferably used over a building coat of rubbing and polishing lacquer.

Crystal Finish Undercoats

The Brevolite Lacquer Co., (also Waukegan Chemical and Lacquer Co.), North Chicago, Ill., announces its new undercoats for air-dry crystal lacquer finishes. This company makes air-dry crystal finishes in pigmented form, and recommends this finish where cost prohibits more than a one-coat finish.

The principal limitation of the one-coat pigmented finish is the small range of colors in which it may be obtained, and it is for this reason that suitable undercoats in all colors have been developed. Kristokrak undercoats are available for wood, metal, paper, composition, Masonite, unglazed pottery, etc. On metal, a bake undercoat is used, but on wood, an air-dry non-grain-raising color or clear sealer is all that is used.

For most purposes the finish is a two-coat operation—the colored

A
NEW FINISH
ENGLISH WALNUT
2844
English Walnut Paste Wood Filler

It's a beautiful, warm, rich brown Walnut shade and gives a perfectly clear, transparent color on either butt or straight grained walnut wood.

And

for shading and overtoning, where the filler takes light on hard and sap veneers, use our

503
Brown Lacquer Shading Stain

Clear and transparent and a true brown shade—with no red or yellow undertones, it is especially adapted for the new Walnut and Oak finishes.

Trial samples of 25 lbs. of the Filler and a gallon of the Lacquer Stain sent on request at the drum prices.

Order trial samples to-day.

THE GILBERT SPRUANCE COMPANY

OFFICES ✖ WORKS ✖ LABORATORIES

Richmond and Tioga Streets
Philadelphia, Pa.

undercoat and the clear Kristokrak. However, where the article warrants it, very beautiful and unusual effects can be obtained by toning over the clear Kristokrak with either bronzes or colors ground in oil or japan, followed with a clear top coat. This can then be rubbed to further improve the appearance.

Marking Golf Balls

The Paasche Airbrush Co., 1921 Diversey Parkway, Chicago, Ill., announces a golf ball spotting unit (Type F629) which prints the marking dots on golf balls in desired color and shape, sharply

Spotting airbrush with "square" head.

and clearly. With this outfit the marking production per man can be easily doubled or trebled over the hand brushing and wiping method. According to the manufacturer: "The same system or method can also be used for air-printing trademarks, symbols, decorations, etc., by furnishing masks of designs or shapes to be applied. The spotting heads however, have to be made to order."

The outfit includes the spotting airbrush, and a square, round or triangular spotting head, as illustrated herewith.

Liquid Metal Primer

The Solfo Chemical Co., Trenton, N. J., has developed a product known as "Solfo Metallic Coating." This metallic coating is a metal, dissolved in a liquid form which, when coming in contact with galvanized metal or zinc products, starts a reaction, forming an alloy metal on the surface of the zinc, protecting the zinc surface from corrosion without the further application of priming agents. This new metal surface is not affected by atmospheric conditions, and is known to make a positive bond for paint, lacquer, enamel, varnish, etc.

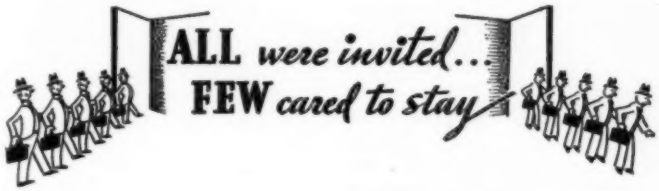
This material is non-inflammable, odorless and non-poisonous, and it is extremely economical, since it covers from 1500 to 2000-sq.ft. per gallon. Solfo Metallic Coating is particularly adapted to the manufacture of all types of galvanized metal signs, where various paints, lacquers, enamels, or varnishes are applied.

Strains Finishing Materials

R. E. Rodriguez, 56 Warren St., New York City, calls attention to an improved line of strainers which are particularly suitable for straining finishing liquids. These strainers are put up in packages of 100 and are designed to hang in service position from the two spe-

In position ready for service.

ABOUT two years ago we welcomed the receipt of a certain invitation to compete for a choice bit of business. Then we were very much smaller and less well known. We considered it a great honor. ¶ A quick production wood-lacquer finish was wanted for radios. The men in charge had drawn their own specifications. They knew what they wanted, they did not know *where* to get it. They opened the doors to everyone . . . almost everyone came!



What they wanted: (1) A high-body sealer to be sprayed over a special 2-hour, air-dry filler without lifting or graying the film. (2) This sealer must be completely dry in 30 minutes. (3) Sanders must be able to cut the sealer to an absolutely level finish in 30 minutes with 5/0 paper. (4) Must immediately spray a high-bodied, rubbed-effect lacquer which will stay wet at least for seven minutes. (This is to prevent a rough surface from over-spray while traveling on the conveyor.) (5) However, the lacquer coat must be dry and set within twelve minutes for an application of a decalcomania. (6) A few minutes later the cabinets pass to the Assembling Department. (7) Within an hour the cabinets must be set hard enough to stand packing into cases and car-loading.

The group of competing lacquer-men who so blithely accepted the invitation to sit in, seemed just a bit crestfallen. Many representatives left because they felt that such a schedule was impossible to achieve. We were of the few that remained. *We met the specifications.*

We have informative Research Bulletins on lacquer-finishing any of the materials listed below. Each of these bulletins represents our solution, by original research, of a specific problem such as the one described in this advertisement.

Check the subjects in which you are interested.

Attach the list to your letterhead.

ROXALIN

Flexible Lacquer Co., Inc.

35-40 Thirty-Sixth St., Long Island City
New York

☐ WOOD ☐ RUBBER ☐ ALUMINUM
☐ BRASS ☐ ZINC ☐ DIE-CAST METAL
☐ CLOTH ☐ GLASS ☐ CADMIUM PLATE
☐ STEEL and Other Ferrous Metals

cial hooks at the front of a pressed metal cabinet containing a supply of strainers.

These "Konomy" strainers are 5x5½-in., and are made in two meshes: XF, for lacquer and varnish, XM, for colored finishes and fillers. The manufacturer calls attention to the fact that these strainers have 100% straining surface, and declares that if more users of finishing materials "would strain their lacquers or varnishes, they possibly would have less complaints to make regarding the materials they are using."

Measuring the Drying Time

This is perhaps the first time you have ever actually seen how lacquer dries on mahogany (although you may have felt how it dries before). The cloth is rolled over drying lacquer at the rate of 1-in. in five minutes. The panels shown in Fig. 1 are 9-in. long; some are 2-in. wide; others are 1-in. wide. It took 45 minutes for the roller to pass from end to end. When the cloth was lifted, the

Fig. 1—Mahogany panels finished and tested on the Dry-O-Graph.

lint was stuck permanently to the lacquer which had not thoroughly dried when the roller passed over that part of the panel.

The measure of the adhering lint in inches multiplied by five is exactly the number of minutes it took for the lacquer to dry. (1-in. five minutes; 2-in. ten minutes; 3-in. 15 minutes, etc.) The Dry-O-Graph shown partly in Fig. 2 is operated by a Telechron motor and does its work automatically and accurately. Once started it

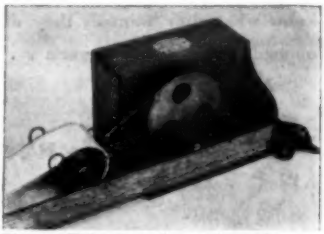


Fig. 2—This view shows the main part of the Dry-O-Graph.

requires no attention whatever by the operator until the drying-time test is completed.

By making a slight change, the roller will travel over drying varnish, printing ink and like products, at the rate of 1-in. per hour and record the drying time in the same way.

These tests are strictly comparative when two are made on the Dry-O-Graph at the same time, because they are under the same atmospheric conditions of humidity and temperature.

The Dry-O-Graph is a product of the Parks Equipment Co., Bourse Bldg., Philadelphia, Pa.

Air-Finishing Outfit

A new air-finishing outfit designed for rapid coverage and greater ease of operation is announced as the latest product of the Gast Mfg. Co., Bridgman, Mich.

This new outfit, designated as the Type H-5, connects direct to the air line and is a complete

ZELLER

Get us straight about this thing called "LOW PRICE"

The Zeller reputation for quality lacquer materials is so well known that our representatives occasionally report the case of a manufacturer who says: "Yes, I know Zellac,—wonderful lacquer, but too high-grade for my work!"

That is a mistaken notion of what Zeller offers!

It is true, Zeller quality always comes first because quality is the foundation of efficiency, and efficiency is the better half of economy. Convinced that a price-per-gallon standard of buying lacquer *cannot lead to economy*, Zeller manufactures only on a basis of VALUE-per-gallon. Yet the low Zeller prices contribute to Zellac economy.

Correctly prepared to meet *your* needs, engineered to do *your* work, specially formulated where requirements are special, there are Zellac grades that will assuredly improve your finishing. *No matter what type of work you have, Zellac grades will prove themselves an economy to you.* Let a Zeller representative quote you our prices—then learn by actual test what you can save in production costs and gain in the salability of your products.

Attention is called in particular to our Zellac Super Wood-Sealer, Wood Lacquers, Zelactite grades for Crystalline Finishes, Zellac Outdoor Exposure clear lacquers and lacquer enamels, and innumerable other grades for every conceivable industrial purpose.

ZELLER LACQUER MFG. CO., Inc.

20 East 49th Street New York City

CHICAGO WICHITA
LOS ANGELES SAN FRANCISCO
PORTLAND DENVER SEATTLE

ZELLAC

painting unit in itself. It is equipped with the Gast "H" gun, which has a wide range of regulation —a heavy, medium or light coat

Complete to connection at air supply line

can be applied and any stroke between 1 and 12-in. wide can be obtained. Shading, blending, etc., can be done without using extra nozzles.

Conditioned for Dipping

The dip tank, used in many finishing rooms for certain kinds of work, has always presented a problem with regard to keeping the finishing material properly agitated, especially when it contained pigments that must be kept uniformly distributed. Some concerns have adopted a system of apparatus for this purpose which actually pumps the material from the tank, strains and agitates it, and returns it into the tank again, this operation being continuous. Needless to say, this frees the tank proper of any encumbering apparatus.—D.O.C.

LACQUER SOLVENTS
COMMERCIAL SOLVENTS CORPORATION
PLANTS:
Terre Haute, Ind., and Peoria, Ill.

Primarily the soundness of American business is the result of better organization, improved business methods, broader outlook and the attraction of the orderly student mind into the vocation of management.

Extends Laboratory Facilities

The Ferro Enamel Corp., (porcelain enamels for cast iron and sheet metal) 2100 Keith Bldg., Cleveland, Ohio, announces that it has greatly extended its Research Laboratory facilities. Apparatus for measuring capacity of the enamel has been added, as well as other equipment.

New Packing in Coil Form

A new Metalastic packing in coil form is announced by Metalastic, Inc., Union City, N. J., in an 8-page booklet. This booklet is ready for distribution to users of packings, and it contains a number of interesting pointers on packing, including how to apply Metalastic.

Ventilating Equipment

The Coppus Engineering Corp., 344 Parke Ave., Worcester, Mass., has ready for distribution its new Bulletin No. 160-3 about "Coppus Heat Killers." This bulletin is 8½x11-in., has 8 pages, and describes and illustrates the Coppus Vano and Aeroplane type heat killers. It also describes and illustrates other Coppus ventilating equipment.

Celebrates Golden Anniversary

June 4, the Cleveland Varnish Co., of Cleveland, Ohio, celebrated their 50th anniversary. This company announces: "At this time we wish to take the opportunity of thanking our many friends for their past patronage. We assure you that all future transactions will be governed by our same Gold Rule Policy."

Metal Finishing Department
Cleaning-Handling Baking & Polishing

Spray Finishing Bakers' Machinery

Secretary and Treasurer of Colbourne Mfg. Co., Chicago, Ill., collaborating with the engineers of A. C. Nielsen Co., compares hand and spray finishing, and gives facts and figures to show the reduction in cost by the latter method

By F. W. CHURCH

IN A GREAT many instances, the so-called "modern production equipment" has created the wrong impression in the eyes of management. It has been associated with mass or volume production for such a long period of time, that many executives consider this equipment not adapted to factories having limited production.

I have in mind spray finishing equipment. Now spray finishing is an old story with us, for we have used this method for ten years, and we know what it is capable of doing in the way of cost reduction. Regardless of the volume of production, there are certain classes of products that require the application of a relatively small quantity of finishing materials. Take for example our line of pie bakers' equipment which includes dough rollers, crust dividers, pie rimmers, conveyors and a variety of automatic combination equipment.

The finished surface areas of many of these products are comparatively small to begin with, and many of these machines have highly polished metal surfaces where a paint finish would not be desirable. Hence you will see that, so far as the

quantity of finished material to be applied is concerned, we are relatively small users, and therefore our case would be comparable to the small plant manufacturing, on a limited scale, a product having a larger area. Obviously, if spray finishing has proved economical in our plant, it should effect a saving in factories where an equal or larger quantity of finishing materials is used.

With the exception of parts having a highly polished surface, the machines must be thoroughly and smoothly coated. Our schedule calls for thorough and complete metal cleaning, application of primer, one coat of surfacer and a final coat of enamel. All of these coats are applied by the spray method with satisfactory results. A thin coat of grease is applied to all highly polished surfaces just before the painting operation begins. This grease masks the surface areas on which no paint is desired.

By our former method of hand finishing, three men working eight hours a day were required for the metal cleaning and painting operations. At the rate of $1.00 per hour, this makes a daily labor cost of $24.00. We used 0.6 gallon of finishing material daily, at an average cost of $2.83 per gallon, equals $1.70 material cost. Adding to these amounts an estimated daily allowance of 10c for brushes, gives us a total daily finishing cost of $25.80.

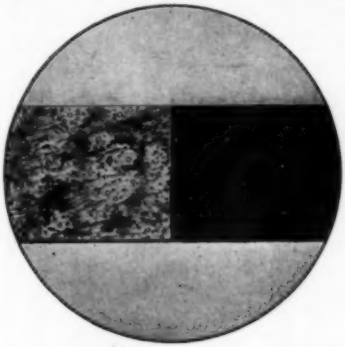
Through the use of spray finishing, one man working eight hours a day, now handles both metal cleaning and painting operations. Of this time, about five hours are devoted to metal cleaning and three hours to finishing. Due to the inherent waste in spray finishing, the daily consumption of finish material is increased from 6/10 to 1 gallon. However, certain inaccessible places on some of the machines are reached with the spray which, under the former hand finishing method, could not be coated.

In this spray equipment we have a total investment of $800.00, of which the gun and hose represents $50.00; the balance includes the compressor, piping, fans and booth. Figuring depreciation and average interest of 6% on the gun and hose on a ten year basis, amounts to $6.65. Calculating depreciation and interest on all other equipment on a 15-year basis, amounts to $74.00. Adding these two items to an allowance of 2% of the total investment ($16.00) for upkeep, gives us an annual fixed charge of $96.65.

The difference between our former cost of $25.80 based on hand finishing and the present cost of $11.45 represents a daily saving of $14.35, or 55.6%. Basing our calculations on a 275-day year, the annual saving would be $3,946.25. At this rate the original investment would be returned nearly five times a year. Besides this most important saving in cost, our product is more thoroughly and uniformly finished. The following table shows interesting figures.

Analysis of Our Present Daily Operating Costs

Fixed charge pro-rate—$96.65÷275 days	$ .35
Labor—1 man for 8-hrs. @ $1.00	8.00
Air based on 810-cu. ft. daily @ $.03 allowing for fixed charges; 8.10 C @ 3c	.24
Power—(¼-h.p. motor on exhaust fan for 3-hrs. daily) Estimated	.03
Paint—1 gallon @ $2.83	2.83
Total daily cost	$11.45



Microscopic enlargement of a section of galvanized metal shows how effectively the pores of the zinc are sealed when treated with SOLFO METALLIC COATING.

SOLFO

METALLIC COATING

for

GALVANIZED SURFACES

Positively Prevents Paint, Lacquer and Enamel from peeling off and the Zinc from Oxidizing

Solfo Metallic Coating is astonishingly easy to apply, using an ordinary paint brush or cloth. It is a colorless, odorless liquid, non-inflammable and non-poisonous. It will not deteriorate.

Because of its affinity for zinc, when applied it becomes an integral part of the surface, protecting the metal from corrosion.

Covers Approx. 1500 Sq. Ft. to the Gallon

ATTACH THIS COUPON TO YOUR COMPANY LETTER HEAD

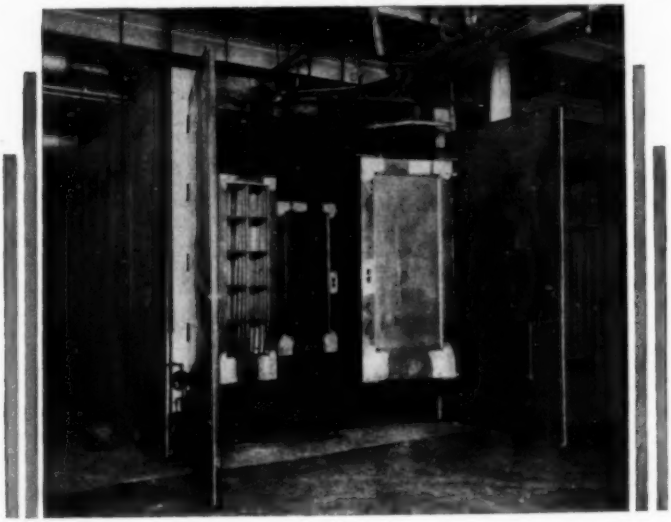
SOLFO CHEMICAL CO.
TRENTON, N. J.

Please send us your folder with further description and uses of SOLFO METALLIC COATING

Firm .....

Address .....

Attention of .....



Improved Bake-Finishing Equipment

By
*S. M. LAUSCH**

How the production of a high quality finish on metal parts was more than tripled after the installation of a new oven and a complete trolley system which facilitates the handling and moving of materials in process

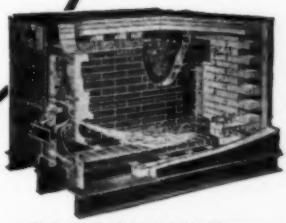
MODERNIZATION and replacement of equipment for manufacturing processes in any program for development should include systematic planning in order to best adapt the equipment to an improved production system. More efficient operation through better handling and heating methods, and improvement in the process will be reflected in the quality of product.

Such systematic planning during recent months led to the installation by the Steelbilt Products Corp. in Clifton, N. J., of a new recuperative-type, indirect heat oven for the baking of coated material. A steadily increasing demand on the production schedule had made increased manufacturing facilities necessary and inadequate oven capacity was the main limiting factor of plant output before the installation was made.

*Public Service Electric & Gas Co.

. . . Important Factors In The Modern Enameling Oven Layouts

that safely increase the speed of production with accompanying reduction in costs of operation and maintenance.



Nichols Model 1931 Air Heater—Oil or Gas Fired

A new measure of enameling efficiency and economy is now being secured by the use of the Nichols continuous conveyor with automatic dip tanks and inclined bottom entry ovens heated by either DIRECT, INDIRECT or a combination of both types of Nichols Air Heaters—oil or gas fired. The work requires no handling from the time it is hung on the conveyor until it is ready for assembly.

Drive and Conveyor on the Nichols CONdensVEYOR System

Literature describing the various elements of these economical oven layouts will be sent upon request.

Conveyor Type Oven Built with New Sadwith Oven Panels

NICHOLS PRODUCTS CORPORATION

12953 Greeley Ave., Detroit, Mich.

NEW YORK CLEVELAND CHICAGO PITTSBURGH PORTLAND, ORE.

Ross Engineering of Canada, Ltd., Montreal, Canada

Effects of Oven Location

By shifting the oven location from one side of the building to a more central location, it is now much easier to supply coated material for baking from each side of the room. Previously, some of the material had to be moved all the way over from the other side of the building. This has proved to be an important economy in consideration of the handling charges for the number and variety of coatings necessary, each of which is baked before the finish is complete.

The indirect gas-heated recuperative oven illustrated at the beginning of this article, which is now in use, has proved very flexible in obtaining the various temperatures required in baking the different coats. To illustrate the scope of operating conditions required by the oven, the typical procedure outlined in the accompanying table was followed.

Coating	Temperature	Baking Time
Metal primer	250°F	3 hours
Two knife fillings	290	3 hours each
Surfacer	200	2½ hours
Primer or undercoat	250	2½ hours
Three enamel or varnish coats	225	3½ hours each

This procedure is made more efficient with the aid of trolley loading. Three tracks in the oven are connected with the trolley system throughout the plant. All material after it has been formed, assembled and ready for finishing, is transported from place to place for the finishing operations, and in and out of the oven by this system. The loading and unloading time of the oven is further decreased by having doors at both ends, so that additional production time is gained.

In production operations that call for the finishing of door frames, doors, and elevator cab frames, the size of the oven was an important consideration. The size installed has worked out very well in providing the flexibility required. The interior of the oven is 10-ft. 6-in. wide, 11-ft. high, and 20-ft. long. It is now possible to load 90 door frames, or 135 doors, or 36 elevator frames for a single batch.

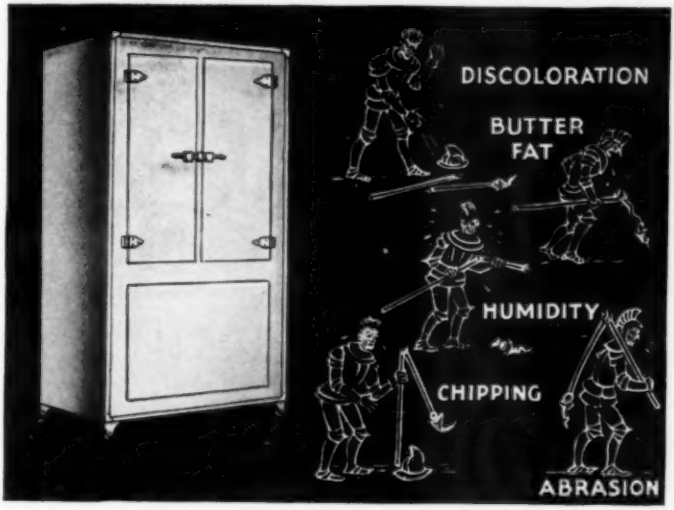
The operation of this larger capacity oven, when compared with a former oven capacity of 26 door frames, or 35 doors, or nine elevator frames requiring hand loading, shows that production can be tripled, while still maintaining the high quality of product. This means that the limiting factor in plant output need not be oven capacity.

Better handling, reducing spoilage and labor charges; better working conditions because of improved methods; improved quality of product with increased production are each and all indicative of well made plans put into operation.

Keeps Out Heat

It is interesting to note that coatings of metallic paints are very effective for reducing the amount of heat transmitted through a thin material, such as canvas. Applied to the underside of a tent or awning, the metallic paint reduces by three-fourths the amount of heat that will come through the cloth. Used on the cover of an automobile or ice wagon, it reduces by 50% the heat that is let through; consequently, it makes the temperature inside the vehicle more nearly the same as what prevails in the natural shade.—O. M. C.

WITH THE RIGHT FINISH, YOU'LL FINISH RIGHT



With Broken Spears, They Give Up The Attack!

Lilly's Lacquer Refrigerator Finishing System

Lilly's Refrigerator Finish offers a triumphant resistance to Humidity, Abrasion, Discoloration, Butter Fat, Chipping, and all other elements of destruction. It's not just another lacquer—it's a system which adapts a fundamentally superior product to the speed of your own conveyor system and to your baking time and temperature. It delivers satisfaction.

Will tell you all about it on request. Write to either office.

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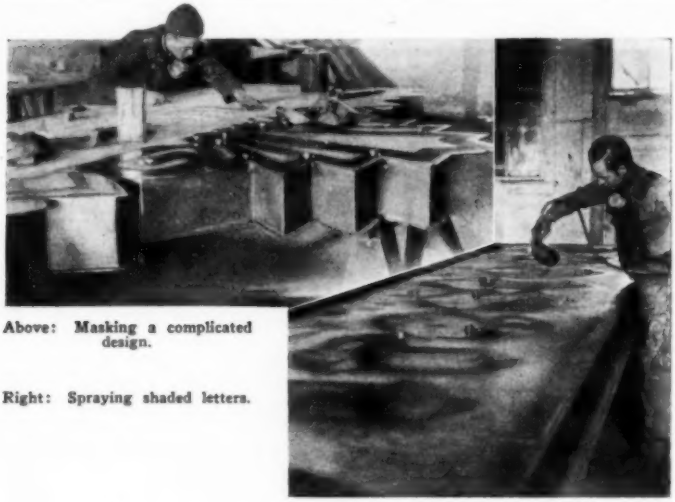
Lilly quality is available in Varnishes, Lacquers, Enamels, Fillers and Stains. Write us about your present or future requirements in the industrial field.

LILLY



Above: Masking a complicated design.

Right: Spraying shaded letters.

Decorating Electric Signs Made of Metal

By
J. C. COYLE

Cleaning and prime coating galvanized sheet metal, cutting and masking of decorative designs, the correct use of colors to prevent bleeding, spray finishing, hand decorating and final finishing

FROM THE first there have been two serious problems in the finishing of metal designs. One was that of breaking up reflections on the surface of the sign, and the other making paint or lacquer adhere properly to the metal. In finishing at the shop of the Electrical Products Corporation of Colorado, at Denver, the first has been satisfactorily solved by the use of a crimped metal for the face of the larger and more expensive signs. Small signs, having a small surface for reflections are not affected seriously, so they are sometimes of plain galvanized metal. The second problem has been solved by the use of a special patented product (name on request) which is applied to the metal surface with a hand brush.

Not only has peeling of the finish been eliminated by the use of this material, but it takes the place of cleaning preparations which were formerly used in the preparation of the metal for finishing. This is a distinct advan-

REZYL No. 110 . . . .

For Bake Type Primers, Surfacers and Enamels

For Air Dry Paints

Rezyl 110 has four outstanding properties:

Ease of formulation. Excellent adhesion and toughness. Free Solubility in petroleum products. Durability.

Rezyl 110 is a basic example of the oxidizing type of synthetic resins. The wide range of its solubilities in hydrocarbons, oils, turpentine and lacquer solvents offers many possibilities for successful application in paints, varnishes and lacquers. Like our other Rezyls, its opaqueness to ultra-violet light rays makes its durability exceptional. Rezyl 110 is supplied in solid form and in solutions.

Write for samples of Rezyl 110. At the same time let us know if you are interested in our other lacquer ingredients: Rezyl Balsams, for plasticizing; Teglac, for furniture finishing; Ethyl Lactate, the high-boiling solvent; and nitrocellulose.

Rezyls are now offered with broad rights to use under United States patents.

Sole Sales Agents for the Nitrocellulose produced by our Subsidiary, American Powder Company.

Industrial Chemicals Division

American Cyanamid Company

535 Fifth Avenue New York

tage in the manufacture of Neon signs where work must be speeded up to meet the growing demand for the product. The preparation is brushed on, allowed to stand 10 to 15 minutes, then wiped off with a cloth, leaving the surface coated thoroughly. It seems almost to become a part of the metal itself. All traces of grease, oil, pencil marks, paint or tar on the metal is effectively removed. The coating is allowed to dry from 2 to 5 hours, according to drying temperature, etc.

Brushing on the cleaning and binding solution.

Other finishing materials stick to this surface perfectly. After it is thoroughly dry the surface is given a coat of material made up of metal primer and metal surfacer mixed 50/50. This is applied in "one heavy shot" or "two light shots," and left to dry from 15 minutes to one hour, according to conditions. It is then sanded with a few strokes of abrasive paper.

The next step is to check colors which are marked on the pattern. White is always sprayed first, as are any raised block letters with white, cream or other light color. Flat painted letters—which happen to be light, non-bleeding colors—are next applied and allowed to dry from 30 minutes to 2 hours. While these colors are drying, any fancy borders or scroll work is traced upon common wrapping paper, which is then cut out with a sharp knife or razor blade and cemented down with a rubber cement made in the shop. This cement is prepared in the shop for two reasons. It is more economical and the user can make it either fast or slow drying to fit the demands of the work. Large designs, or lettered surfaces, which require more time to apply, require a slower drying cement.

The letters or designs are pressed down tightly on the metal surface to avoid making any fogged or uneven edges. The surplus rubber is then rubbed off with a ball of the rubber held in the hand. If an outline is then desired it is sprayed on and let dry until the hand can be rubbed across the surface without showing any marks. The time varies from 10 minutes to an hour, depending on the amount of material applied, and the temperature. If there is a border, or any other part of the sign with the same color, it is sprayed on at the same time.

Next there is the masking of the border, which is done with a factory prepared gum tape, commonly called "Scotch" tape, which may be used over and over several times. This may be had in any desired width. It is also used to stick down around the edges of flat painted letters which have already been sprayed. Large and complicated designs, however, are always masked with paper and

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A flexible spraying enamel that withstands extreme temperatures and gives a satin-smooth, porcelain-like tough surface. Will not chip. No orange-peel appearance.

Try Snow-White Lacquer Enamel on *your product* and see the wonderful result obtained so economically. We will send a working sample on request.

One of the country's largest electric refrigerator factories uses 8,000 gallons a week with unfailing satisfaction.

LOUISVILLE VARNISH CO.
INCORPORATED

LOUISVILLE, KENTUCKY

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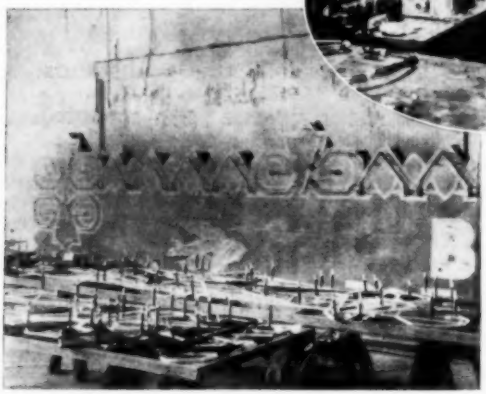
rubber cement, cementing on paint lines only. If the design is too complicated to handle after it is cut out, the whole design may be cemented down and cut out after it is applied to the sign, leaving only the parts which are necessary.

The raised portion on sides of block letters, if any, are sprayed next. When dry, the sides are covered with tape, using 1-in., 2-in. tape, etc., according to the height of the letters. Outlines on the background about the raised letters are also covered in this way. Raised mouldings are sprayed last, by simply masking a strip along each side.

Flat painted letters, which are shaded instead of outlined, are cut out as one letter, the lighter color being sprayed on first. The letter and shaded portion are then cemented down as one. It is next cut on lines which separate the shaded portion from the letter, the part being removed over the darkest color. This color is then sprayed on the letter or shaded portion, as the case may be, and it is re-masked.

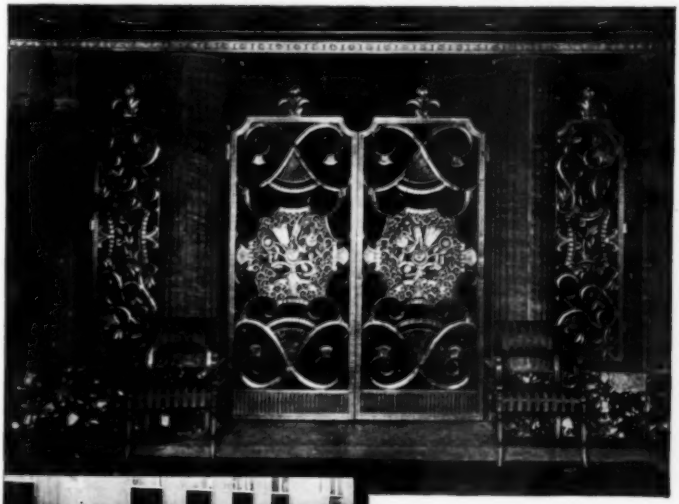
The remainder of the sign is then sanded and brushed off clean and the background is sprayed on in two or three coats, each coat drying from 30 minutes to an hour. When the background is dry the tape and masks are all pulled off and any rubber sticking to the sign is rubbed off. The surface is then given one or two heavy coats of clear lacquer. After the final finishing coat is dry the sign is transferred to the electrical shop for application of electrodes, wiring and glass tubing. Cross-over sections of this tubing (the portion between letters) is painted the color of the background on the sign behind it. The first coat is always of black lacquer to prevent light coming through. Lacquer only is used, because oil will short the current through the tube.

Above: Painting glass tubes for neon signs.



Left: Where neon tubing is "blocked off" and applied to signs; section of sign in background.

• *And finished with* EGYPTIAN LACQUER



Swing gates to alcove, with fixed panels, alcove of promenade, main lobby.

Balcony railing, main ballroom.

• These photographs show metal-work in the new Starrett Netherland Plaza Hotel, Carew Tower, Cincinnati, Ohio. Architects: Walter W. Ahlschlager, Inc., and Delano and Aldrich. Builders: Starrett Brothers, Inc.

Cast and hand-tooled nickel silver is the metal. Crafted by The Newman Manufacturing Co., Cincinnati. The finish is Egyptian "Sublime White".

THE EGYPTIAN LACQUER MFG. CO.
90 WEST STREET - NEW YORK CITY

Branches in charge of practical men *maintained in:*

ATLANTA	KANSAS CITY
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CLEVELAND	SEATTLE
DALLAS	SPOKANE
DETROIT	ST. LOUIS

In finishing it occasionally becomes necessary to shoot a light color on over a dark, bleeding color. This may be done successfully by the use of a patented preparation (name on request) used at this shop. Two shots of this material applied to the dark surface will stop any bleeding through, even when white is applied over red. Each shot is allowed to dry for an hour or more.

Plant Protection Finishes

It is one thing to protect our product with a suitable finish, but quite another to protect our plant and equipment in the same way; often the latter is the harder problem. It would seem that the plant with a well developed finishing department should certainly be up on this end of the maintenance proposition, particularly since special finishing material, which will resist both heat and acid, and will adhere even to galvanized iron, is available. Protection for the plant equipment, the same as for the plant product, can be sprayed on.—G. E. B.

Finishing material of the pressure type have made it possible to absolutely control the physical factors governing the supply of finishing materials to spray guns.

Air Heater Bulletin

Nichols Products Corp., 12853 Greeley Ave., Detroit, Mich., has ready for distribution its new Bulletin No. 111 about "Nichols Air Heaters" for heating industrial ovens. Bulletin No. 111 is illustrated and has 8 pages 8½x11-in.

Sales of Lacquers

The accompanying figures represent the quarterly statistics on sales of finished lacquer, lacquer thinners and dopes based on data reported to the Bureau of the Census by 109 manufacturers. These figures include sales of package goods to jobbers and dealers.

Year and Quarter	Finished Lacquers		Lacquer Thinners		Dopes*	
1930	Gallons Sold	Sales in Dollars	Gallons Sold	Sales in Dollars	Gallons Sold	Sales in Dollars
1st Qtr.	3,448,445	8,169,311	2,861,887	3,193,841	314,347	462,831
2nd Qtr.	3,793,204	9,153,228	3,010,580	3,390,605	313,982	474,089
3rd Qtr.	3,238,964	7,732,069	2,571,924	3,044,069	259,508	445,098
4th Qtr.	2,770,776	6,413,854	2,087,726	2,298,859	221,136	359,563
Total (Yr.)	13,251,389	31,468,462	10,532,117	11,927,374	1,108,973	1,741,581
1931						
1st Qtr.	2,838,513	6,526,934	2,542,295	2,579,213	221,583	376,246

*Does not include base solutions used in the manufacture of lacquers.

MERRIMAC LACQUERS

Finishing materials made by Merrimac are preferred in widely divergent lines of industry. The highest standards are maintained by our development and manufacturing departments. A fine example of a unique, quality lacquer offered by Merrimac is—

R 1743
TOPCOAT LACQUER

This is an extremely high solid, nearly water white topcoat lacquer. It gives a high natural gloss but may be buffed, particularly when used over a bronze. The building is that of a wood lacquer while the color resembles the silver lacquer type. R 1743 is sold at spraying viscosity.

Your inquiries and orders for Merrimac Lacquers are invited.

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A Division of
Monsanto Chemical Works

Flood-Light Finishes

By
R. E. HAUSCHILD

The following systems are the results of experiments on galvanized metal over a period of years and may be used with the assurance that they will give satisfactory results

IF IT IS necessary to finish *galvanized* floodlights, the really durable prime coat that will adhere to this surface is a high grade pyroxylin primer in red oxide or preferably of gray color.

This outside primer should be obtained ready for spraying and designed from one-half second cotton and ester gum, the solid content not less than 30%, and the pigment not more than 5%. A thin wet coat is applied to the exterior surface and allowed to dry 30 minutes.

The finish coat is of a high-grade exterior finishing lacquer, plasticized to a high degree to give extreme durability. This lacquer should contain as much as 30% of solids, and the cotton should be of one-half second type and dammar gum. Material should be reduced 50/50 with a good grade of thinner and 1½-lbs. of aluminum bronze powder added to each gallon of reduced clear lacquer. Note: The powder should be cut with thinner to a thin paste, then poured into the reduced clear lacquer, stirring the while.

Three coats of this aluminum mixture should be applied to build up resultant film for proper wearing.

A true heat-resisting oleoresinous flat or pyroxylin flat white is not to be had, although I have seen some very fine results with both up to a certain period.

A good fixture dull white, made of a mixture of titanium oxide and zinc, will hold up to a period of 500 hours; above temperatures of 300° F., disintegration of the cotton takes place. A good oleoresinous flat lacquer that will stand 350° F. can be obtained which should consist of:

Titanium oxide	10-lb.
French zinc	5-lb.
Cobalt blue	touch of

Added to each gallon of vehicle, which can be made as follows:

Dammar varnish	26 liquid-oz.
Wood oil varnish*	45 liquid-oz.
Pale dryer	6 liquid-oz.
Turpentine	51 liquid-oz.
Total 1 gallon	128 liquid-oz.

The most desirable method of finishing galvanized surfaces is by treating the metal to reduce the zinc salt action to a minimum and allow paint to adhere firmly without fear of peeling. The following solution will stop this action:

Water	50-gal.
Nitric acid 44° Baumé	55-lbs.
Com. phosphoric 52° Baumé	97-lbs.
Com. aluminum sulphate	4½-lbs.

Apply with a brush to galvanized surface just as though you were painting same. Do not clean off but allow action to complete itself, and a surface will result which will have plenty of "tooth" for the paint coatings to adhere to. Allow metal to dry thoroughly from 16 to 24 hours, depending on atmospheric conditions and temperature. Apply to outside surface

* 50 gallons of oil to 50-lbs. of treated rosin.

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Trade Name

Synthetic Enamels

(Baking or Air Drying)

The paint manufacturer's closest approach to a porcelain finish in enamel.

IIas unusual adhesion — hardness of baked finish — high gloss or dull — quick bake. High solids give exceptional build and toughness without brittleness.

Available in one coat white, black and solid colors for metal furniture, refrigerators, etc. Technical advice gladly furnished.

It stands the test!

John L. Armitage & Co.

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NEWARK, N. J. and DETROIT, MICH.

DECALCOMANIA LACQUERS

The growing vogue for the new types of decalcomanias requires specialized undercoats and top coats.

For primers and surfacers of proper composition; for non-lifting top coats; for flexible finishes that permit forming the finishing article; for any requirement or difficulty in the application of the NEW decalcomanias, communicate with us.

We may have very interesting data for you

THE VARNISH PRODUCTS CO.

12900 Berea Road **Cleveland, Ohio**

an admixture of ½-lb. of aluminum bronze powder to one gallon of synthetic exterior clear finish of glyptol type and requiring about 15 to 18 hours to dry hard; this material will hold up for a year on outside exposure.

A synthetic flat white may be used with much success on the interior surfaces, and very good heat-resisting qualities may be obtained. I have personally made tests running whites at 300° to 350° F. without undue discoloration. This material has been perfected to a high degree by a large specialty paint house which recommends a 400° F. baking period for other types of colors, and the results are astounding. Whites are the most delicate and if extreme heat is exerted for long periods, I would suggest using vitreous enamel for the most durable lasting white.

Aluminum Paint

Due to its permanence, great protective quality, low costs, ability to reflect light, value as an insulator, and water-proofing material, aluminum paint in the last few years has grown very rapidly in general use.

Most of the oil companies are using it for painting tank-cars and storage-tanks. Many manufacturers are using it in varying degrees for plant maintenance. Railroads, cities and public utilities are adopting it as standard for bridges, poles, guardrails, safety zones, etc., and it is commencing to find its place as a priming material for lumber. Used for this purpose, it retards moisture penetration, adheres firmly and provides an excellent surface for the finish coat. This particularly applies to siding and outside trim, where it prevents excessive expansion and contraction and thereby saves the finish coat from cracking or peeling and also as an insulator for the house, making it cooler in summer and warmer in winter for the reason that it actually provides a casing of aluminum metal.

Aluminum paint is composed of tiny flat polished flakes of aluminum metal treated in such a manner as to give it what is called "leafing quality." This word, "leafing," describes the action of the flakes when applied in paint, whereby they rise up to the surface, flat side out, overlapping each other like leaves falling to the ground from a tree.

Aluminum paint is made simply by adding to a suitable vehicle or bronzing liquid the aluminum powder and stirring thoroughly, and this mixture should be made as the paint is required for use rather than mixed in bulk and allowed to stand.

Bronzing liquids vary greatly in their makeup and the use to which the paint is to be put more or less determines the liquid. For instance, for indoor maintenance work a light varnish may be used on brick, wood, metal, stone, or cement, and for all outdoor work a spar varnish is recommended. For priming a dry, unpainted wood, a very acceptable vehicle is made with heavy bodied linseed oil reduced by the addition of turpentine in proportions of about three to two.

The use of this metal coat for priming and waterproofing wood is growing rapidly and promises to continue to increase in favor.—J. D. W. S.

Misdirected research is as bad as no research at all.

Weather-OMeter

Will the finish stand without checking, cracking, or peeling under tropical suns and desert sands? Will it remain bright and smooth under severe and sudden temperature variations? How will humidity changes effect it? These are daily questions with the finisher and the manufacturer of industrial finishes. And the answer must not be claims but demonstrable facts.

By making possible the reproduction of any of these conditions outlined above, controlled, accelerated, Weather-Ometer makes scientific study of any coating possible under actual conditions of use. The determinations thus made are accurate—dependable. Details will gladly be sent you in our new Bulletin I. F. 6.

We are also Creators and Distributors of Fade-Ometer—Standardized Sunlight; Launder-Ometer—Standardized Machine for Laboratory Washing Tests; Wear-Ometer—Standardized Wear Test Machine.

New York—Boston—London—Berlin—Osaka

ATLAS ELECTRIC DEVICES CO., INC.

361 W. SUPERIOR ST., CHICAGO, ILL.

Superior Galvannealed PATENTED PROCESS

Superior "Super-Metal" PATENTED PROCESS

Two RUST-RESISTING Steel Sheets Coated with Spelter (Zinc) and Heat-Treated after being Coated. Have Etched Surfaces to which Finishes Adhere Firmly.

Sample and Booklet on Request

The SUPERIOR SHEET STEEL COMPANY
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Division of Continental Steel Corporation — General Offices, Kokomo, Indiana
Plants at — Kokomo, Indianapolis, Canton.

Manufacturers of: Black, Galvanized, Long-Terne and Special Coated Sheets, Roofing and Kindred Products; Billets, Rods, Wire, Nails and all types of Fence. (133)

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Questions and Answers

This service department is conducted to meet the reader's need for prompt information on specific problems, and to give others an opportunity to review the questions and to offer any further comments or recommendations pertinent to subjects mentioned

Honey, Autumn, Brown Maple

We would like some information on how to finish our "spool beds" in honey, autumn and brown maple finishes on such woods as soft maple, tupelo and sap gum. We want a soft satin finish that is in keeping with pieces of this kind.—E. E. B. Co.

For honey color I suggest the following: Sponge the surface to be finished with clear water and sand smooth. Dissolve 1-lb. oxalic acid to one gallon water, and stain the surface with this material. Let dry about 10 hours and then stain with a solution made up in the proportion of 4-oz. of tincture iron chloride to one gallon of water. When dry, sand with No. 6/0 sandpaper. Fill with natural filler that has been colored with chrome yellow and orange medium, using equal parts of each or whatever proportion and quantity are necessary to produce the shade wanted; and let dry for 24 hours. Apply one coat of lacquer sealer; sand with No. 4/0 sandpaper; give two more coats of clear lacquer, and oil rub for a dull rub finish.

For the autumn color use No. 741 yellow brown tone stain (mfr's. name on request). This stain will give the autumn color. The formula and how to use this stain will be found on the can.

For a brown maple finish use No. 141 antique brown amber; also No. 144 golden amber (from the same manufacturer). This will make a beautiful brown maple finish. The formula is on the container.—T. R. Nall.

Brown maple, honey, and autumn brown finishes may be supplied in the form of water stain powder and, when dissolved in the proper proportion of water, give very attractive and desirable shades.—G. F. Walker.

Soft Brown Walnut Stain

Can you send us a formula for a soft brown walnut stain as nearly like real walnut as possible? We use a Circassian walnut stain mixed with equal parts of leptyne; to this we add burnt umber. While this stain is pretty, we thought perhaps you could suggest a better way to get a soft walnut brown. As we are dealing in period furniture reproductions we want a good finish, and while the cost is a consideration, it is not primary.—E. E. B. Co.

Instead of purchasing a walnut stain and then altering it to meet certain requirements, we believe it is perfectly feasible to have the stain manufacturer provide the exact shade required, and this

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Send me full details on Pulmosan R-150 Respirator in metal container.

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would be more economical for the stain user. Various shades of colors can be furnished, which makes it unnecessary to alter the stains purchased from the manufacturer.

In ordering special shades, it is a good idea to submit both a sample of the color desired and the kind of wood on which the stain is to be used; then the stain manufacturer can match the proper effect accurately. If a sample of the wood to be used is not also enclosed, it might be difficult for the manufacturer to match the sample as accurately as would be required.—James B. Day & Co.

For a soft brown walnut stain, use No. 8 standard brown tone walnut (mfr's. name on request). The formula and how to finish all comes labeled on the stain powder can.—T. R. Nall.

For a soft brown walnut stain, a pigmented oil stain cannot be surpassed if properly made and wiped, with the necessary time given for drying before coating.—G. F. Walker.

Finishing Domino-Shaped Blocks

We are interested in some process that is practical for finishing maple wood blocks in black and other colors, using we believe a lacquer for this purpose. We have information from three different sources, but are not sure which system to adopt.

One is a tumbling barrel proposition; another is spraying, and the third is dipping. Then there is another system, where the wood blocks would be

fed on a conveyor that passes through the lacquer, and by the time they reached the end of the conveyor they would be not only coated but the finish would be perfectly dry and smooth, without any grain or lines showing on the surfaces of the wood.

We were wondering if you could advise us on this score, impartially, as to what system to use for these wood blocks. They are blocks with square edges that average approximately 2-in. long, 1-in. wide and 3/8-in. in thickness, and other sizes in proportion.—T. E. Co.

If the sharp corners of the blocks are to be preserved, a tumbling process cannot be considered, as this would round up all corners and edges.

The spray method, if an opaque lacquer finish is required, will probably be found the most practical—though expensive if a perfect finish is to be produced.

It is not possible to secure a perfect colored lacquer finish on square blocks economically by dipping.

A conveyor system might be devised to do the job, applying the material with a coating machine, if the production would warrant this expense.

As a general proposition, I would recommend the following: First, place blocks in a wire basket and dip in one of the permanent stains (name on request) of the color desired. Allow to dry four hours. Then, place in a wire basket and dip in wax (a thin coat) and let dry one hour. Place a quantity of the blocks in an adjustable form and buff up on a rag wheel.

If these blocks are to be used as dominoes or a similar game, I believe this finish will prove to be

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the most satisfactory from every angle.—A. B. Laboratories.

It is rather difficult to intelligently determine the suitability of any process without complete knowledge as to the extent of production, class of finish required and the possibility of suspending these blocks either for a conveyor or a dip finish. For convenience I have designated the processes, A, B, C and D.

Method A—While spray finishing is an important and useful process of finishing, I cannot see how it could be economically used in finishing these wood blocks. Not only would the handling cost be excessive, but it would be extremely difficult to coat the six sides of each block. Practically the only way this could be accomplished would be to place the blocks on a conveyor which passes through a spray machine having several guns mounted so as to spray the material on all sides of the blocks as they traveled along. In my opinion this is entirely impractical both from the excessive cost of handling and from the waste of material in spraying small individual units.

Method B—The tumbling barrel has been used advantageously in many plants for finishing both metal and wood parts in reasonably small sizes. If correctly applied, it is possible to obtain an excellent finish by this method. The labor cost of this method is not exceptionally high; however, I believe you will find that this method is the slowest of any you mention. As far as finishing material cost is concerned this method is perhaps the most economical.

Method C—I have never heard of the "conveyor that passes

through the lacquer," but again in this case it would be necessary to handle each block individually in placing them on and removing them from the conveyor. This would naturally increase the labor cost. As far as finishing material cost is concerned, this method compares favorably with dipping, which, as you know, is the most economical with the exception of tumble finishing.

Method D—If the quality of finish produced is acceptable, dipping is perhaps the best method of finishing these blocks from the standpoint of economy of both labor and material. In this method, the blocks are shoveled into a wire basket, which is then immersed in the lacquer. After all of the surfaces are thoroughly coated, the blocks are unloaded onto a series of sharp, fine pointed pins (inserted in a lattice frame) to drain and dry. Of course these pins or finishing nails must be fairly close together to prevent the blocks from becoming wedged between the pins. If the points are sharp and sufficiently pointed, no marks should appear on the finished surface of the blocks when dry. To give you a better idea of the quality of finish produced by this method, I might say that golf tees are finished in this manner and unloaded on a wire screen to drain and dry.

Summarizing the above methods, it is my opinion that Method A will undoubtedly give you the highest quality of finish, and it is the most expensive method in point of both labor and material.

Method B will produce the next quality of finish, and it is the most economical of any method from the standpoint of material. The labor necessary to this process is less expensive than in Method C, and slightly greater than in Method D. However, it is well to remember that this method consumes more time than any of the other methods, due to the tumbling period.

Method C is next in line with the quality of finish, comparing favorably in labor cost with Method A, and in material cost with Method D.

Method D is the process I would recommend for your purpose, or I shall modify this by saying that I recommend that you experiment with this method to ascertain whether or not the quality of finish produced is suitable for your use. It will probably be necessary to turn the blocks (on the pins) a minute or two after they have been unloaded so that both flat surfaces have an opportunity to

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drain. The saving in both labor (even with the turning operation) and material used in connection with this method is apparent.

In the event the quality of finish produced by Method D is not satisfactory, I want to suggest that you consider an overhead conveyor on which the blocks are suspended by means of clamps or holders similar to the wooden clothes pins with a brad inserted in the jaws (such as used in hanging veneers to dry). This conveyor should pass over the dip tank and at this point the conveyor line is depressed so that the blocks will be immersed in the lacquer. At the outfeed end of the dip tank, the conveyor line begins a gradual incline over a drip or draining pan. This conveyorized-dip method is sometimes used in finishing metal beds as well as other metal products.

I believe you will find that the quality of finish will be greatly improved over Method D, due to improved draining conditions offered by this method. Of course, the labor cost will be increased due to clamping and removing the blocks from the conveyor. I suggest this method because I believe it will produce a better quality of finish than Method C. Personally I consider Methods A and B entirely out of the running, provided, of course, I have interpreted your inquiry correctly.

Lehman of Roxalin Now With Agash Refining Corp.

M. S. Lehman has resigned as secretary and treasurer of the Roxalin Flexible Lacquer Co. Inc., Long Island City, and has accepted a position as treasurer of the Agash Refining Corp., 99-101 Hudson St., New York City, which was recently organized to take over A. Gash & Co. Inc., of New York and the Atlantic Salad Oil Refining Corp., Bush Terminal.

A Protective Top-Coat for Crystal Lacquer

The new type of finishing material known as crystal lacquer, which is produced under various trade names by different manufacturers, is growing in favor as a decorative finish; and the great variety of pleasing effects possible to obtain by different crystal formations and color combinations are sure to increase the popularity of this material.

The possible uses of this finish have been somewhat retarded by the fact that a suitable top coat has not been available.

Clear lacquer has been used extensively, but it has been found that this can only be applied in the form of a dry coat producing a thin film which does not give a real protective coating—and this material if applied heavy will destroy the beauty of the crystal formations.

Recent experiments have shown that a satisfactory top coat is produced by the use of one of the better grades of synthetic-gum varnishes. (Names of manufacturers of material which has proven satisfactory will be furnished upon request.) This material can be applied with any desired thickness of film. The only effect of a heavy coat is a slight darkening of the finish and an increase in luster.

Due to the well known qualities of this material, a crystal finish may be produced which is durable and weatherproof.—E. S. Atkinson.

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EDITORIAL

Finisher Training

The finishing of industrial products has become such an important factor in the final production process of all finished articles that it is time this work should be intrusted only to men who are experienced, skillful, well informed, and loyal to their employers. There are only a very few men who will develop up to this point from their own initiative. The average workman needs encouragement, careful guiding, and diplomatic directing from his superiors; he needs to be informed and reminded and given a word of appreciation at reasonable intervals instead of being ignored excepting when he has done something to merit criticism.

Perhaps it is a far cry from finisher to truck driver, although many a finisher has possibly been referred to as being better fitted for driving a truck; nevertheless, several firms who operate trucks have gone in for training their drivers, and in a recent issue of *Domestic Commerce* an article headed "Truck Driver Training Reported to Reduce Cost and Increase Business" reveals some interesting facts resulting from the training of these workmen. All of which brings to mind that if truck drivers merit training and if the training produces such excellent results for the employers, why not give more attention to finisher training in all industrial establishments?

School Furniture Brown Finish on Pressed Metal

Further evidence that color, finish and surface texture have become leading factors in the selling of more and more products is strikingly revealed in the four-page circular of a manufacturer of steel lockers. This circular announces "School Furniture Brown as a standard finish for lockers . . . the popular color at no increase in cost over olive green."

The circular presents several installation pictures in color and calls attention to the fact that "modern trends in decorating school building interiors are leaning decidedly to color combinations of creams, buffs, and browns. Depressing black has long ago been discarded and its successor, olive green for steel lockers and school furniture, has been losing favor. These progressive and popular trends have been sensed by the . . . locker specialist and as a result of hundreds of studies and color experiments the company offers walnut (school furniture) brown as a standard locker color . . . a comparatively simple matter to decorate rooms and corri-

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Southern Lacquer Co.
BALTIMORE-MARYLAND

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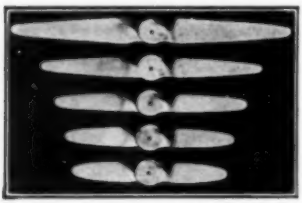

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dors when selecting tile, bricks, linoleum, wall paints, etc., to match this attractive, bright color."

Clothes lockers, waste lockers, finishing strips and corner plates are offered in the new finish.

When Good Finishing is Appreciated

To appreciate good finishing, inspect a job of poor finishing. Recently I was a guest at a home where a new corner cabinet—a planing mill bargain—had been installed. The housewife wasn't entirely satisfied with it, principally because it was too large, although possibly she did intuitively feel that it was also out of harmony with her interior woodwork and other furniture.

The finisher, instead of improving on the cabinet job in the white, had done absolutely no staining to equalize the contrasting colors in the birch wood, and by finishing the red and light sap wood surfaces strictly clear, he emphasized the carpenter-shop class of cabinet work which so often comes from planing mills.

Disregarding what factors entered into the selection and purchase of this cabinet, the fact remains that here was a fair cabinet job made common and extremely cheap looking through lack of a suitable finishing job. What a pleasing transformation could have been made in its appearance with a proper finish put on by a well informed skillful finisher who takes pride in the excellence of his handiwork.

The research laboratory is the means through which likely ideas may be made practicable. .